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PATENT

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

Attorney Docket No.: HOE-774

In re Application of:

E. Baiker

Serial No.: 10/656,831

Filed: September 5, 2003

Examiner: C. Koehler

Art Unit: 3726

For: **DEVICE AND METHOD FOR THE BLASTING TREATMENT OF CHANNEL INNER WALLS**

I hereby certify that this correspondence is being deposited with the United States Postal Service as Express Mail, postage prepaid, in an envelope addressed to: Mail Stop: Appeal Brief - Patents, Commissioner for Patents, Alexandria, VA 22313-1450, on August 2, 2006.

By: Carol Prentice
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APPELLANT'S BRIEF (37 C.F.R. 41.37)

This brief is in furtherance of the Notice of Appeal filed in this case on June 12, 2006 (mailed June 7, 2006).

The fees required under §41.20(b)(2) are accounted for in the accompanying TRANSMITTAL OF APPEAL BRIEF.

This brief contains these items under the following headings, and in the order set forth below (37 C.F.R. 41.37(c)):

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(1) REAL PARTY IN INTEREST

The real party in interest in this appeal is: Baiker AG, a Swiss Corporation having its principal place of business at Alpenstrasse 1, 8152 Glattbrugg/Zürich, Switzerland, the assignee of a 100% interest in the application.

(2) RELATED APPEALS AND INTERFERENCES

There are no other appeals or interferences that are related to this appeal or that will directly affect, be directly affected by, or have a bearing on the Board's decision in this appeal.

(3) STATUS OF CLAIMS

The status of the claims in this application is:

A. Total Number Of Claims In Application:

There are 12 claims pending in the application. The pending claims are claims 16-27.

B. Status Of All The Claims:

1. Claims canceled: 1-15
2. Claims withdrawn from consideration but not canceled: None
3. Claims pending: 16-27
4. Claims allowed: 25-27
5. Claims objected to: None
5. Claims rejected: 16-24.

C. Claims Being Appealed:

The claims being appealed are: 16-24.

(4) STATUS OF AMENDMENTS

Applicant filed an Amendment on December 19, 2005 (mailed December 15, 2005) in response to the September 27, 2005 Office Action. Claims 1-15 were cancelled and new claims 16-27 were added by this Amendment, which was entered by the Examiner.

Applicant filed an Amendment on May 2, 2006 (mailed on April 28, 2006) in response to the March 8, 2006 final Office Action. Clarifying amendments were made to claims 24 and 27 in this Amendment. In response, the Examiner issued an Advisory Action, which was mailed on May 16, 2006. Applicant noted that this Advisory Action was incomplete as to the "Amendments" section and telephoned the Examiner to discuss this issue. A corrected Advisory Action was mailed on June 12, 2006 indicating that Applicant's May 2, 2006 Amendment was entered for purposes of appeal and identifying the status of the pending claims.

(5) SUMMARY OF CLAIMED SUBJECT MATTER

The claimed invention relates to a device and method for shot peening an inner wall of a channel having at least one bend in a longitudinal direction with a stream of shot-peening particles. A flexible plastic tube is provided that can be advanced through the bent portion of the channel for introducing the stream of shot-peening particles into the bent portion of the channel. An outlet end of the tube is provided with a particle deflection and outlet device for directing the shot-peening particles against the inner wall of the channel. An elongated helically wound wire is provided which encloses the flexible plastic tube for reducing friction between the tube and the inner wall of the channel when the tube is advanced through the channel. Such a shot-peening device is set forth in Applicant's claims, as follows:

Claim 16: *"A shot-peening apparatus for shot peening, with a stream of shot-peening particles, an inner wall of a channel having at least one bend in a longitudinal direction thereof."*

Applicant's Figure shows a longitudinal cross-section of an example shot-peening apparatus in accordance with the present invention as inserted into a metal pipe (channel) (See, e.g., Applicant's specification, page 5, second full paragraph). It is noted that the specification, which is a translation of Applicant's German language priority document, refers to "ball" or "shot" blasting as a method for improving the strength of metallic surfaces (specification, page 1), which is a technique commonly known in the U.S. as "shot-peening." A stream of particles is introduced from the device against an inner wall of pipe 10 (channel) which as shown in the Figure has at least one bend therein in its longitudinal direction (See, e.g., Applicant's specification, page 2, second full paragraph).

The shot-peening device according to claim 16 comprises:

"a flexible plastic tube advanceable through the bent portion of the channel for introducing said stream of shot-peening particles into the bent portion of the channel;"

Referring to Applicant's Figure, the shot-peening device comprises a flexible plastic tube 20 which is advanceable through the bent portion of the channel 10 for introducing the stream of shot-peening particles into the bent portion of the channel 10 (See, e.g., Applicant's specification, page 2, third full paragraph; and page 7, first full paragraph).

"an outlet end on said tube;"

Referring to Applicant's Figure, the tube 20 has an outlet end (end of tube 20 with nozzle member 22 secured thereto) (See, e.g., Applicant's specification, page 6, first paragraph).

"a particle deflection and outlet device attached to said outlet end for directing the shot-peening particles against the inner wall of said channel;"

Referring to Applicant's Figure, a particle deflection device, deflection member 26 is attached to the outlet end of tube 20. This particle deflection device 26 has a deflecting surface 26a which deflects the shot-peening particles out exit opening 22a and

against the inner wall of the channel 10 (see, e.g., Applicant's specification, page 6, first paragraph).

"an elongated helically wound wire enclosing said tube for reducing friction between the tube and said inner wall when the tube is advanced through the channel;"

Referring to Applicant's Figure, an elongated helically wound wire 30 encloses the tube 20 and acts to reduce friction between the tube and the inner wall of the channel 10 when the tube 20 is advanced through the channel 10 (See, e.g., Applicant's specification, page 2, third full paragraph; page 3, third full paragraph to page 4, first full paragraph; and page 6, second paragraph).

Claim 17: *"wherein the tube is a polyurethane tube."*

The tube 20 may be a polyurethane tube (See, e.g., Applicant's specification, page 6, lines 15 and 16).

Claim 18: *"wherein the diameter of the wire is equal to the thickness of the wall of the tube."*

The diameter of the wire 30 may be equal to the thickness of the wall of the tube 20 (See, e.g., Applicant's specification, page 4, second full paragraph).

Claim 19: *"wherein the diameter of the wire is smaller than the thickness of the wall of the tube."*

The diameter of the wire 30 may be smaller than the thickness of the wall of the tube 20 (See, e.g., Applicant's specification, page 4, second full paragraph).

Claim 20: *"wherein the distance between sections of the helically wound wire adjacent to one another in a longitudinal direction of the tube is approximately the same or smaller than the diameter of the wire when the tube extends in a straight line."*

The distance between sections of the helically wound wire 30 adjacent to one another in a longitudinal direction of the tube 20 may be approximately the same or

smaller than the diameter of the wire 30 when the tube 20 extends in a straight line (See, e.g., Applicant's specification, page 4, third full paragraph).

Claim 21: *"wherein sections of the helically wound wire adjacent to one another in a longitudinal direction of the tube abut on one another when the tube extends in a straight line."*

Sections of the helically wound wire 30 adjacent to one another in a longitudinal direction of the tube 20 may abut on one another when the tube 20 extends in a straight line (See, e.g., Applicant's specification, paragraph bridging pages 6 and 7).

Claim 22: *"wherein said wire is a spring wire."*

The wire 30 may be a spring wire (See, e.g., Applicant's specification, page 6, lines 24-25).

Claim 23: *"wherein the helically wound wire has ends which are held at the tube to restrain displacement of the wire relative to the tube in a longitudinal direction of the tube."*

The helically wound wire 30 has ends which are secured relative to the tube 20 such that the wire 30 as a whole cannot move relative to the tube. For example, as shown in the drawing, one end of the wire 30 is widened by the nozzle member 22 and the other end is widened by the clamping sleeve 16. Further, the nozzle member 22 and clamping sleeve 16 serve as axial stops for the wire 30 (see, e.g., Applicant's specification, page 6, second paragraph).

Claim 24: *"wherein said channel is the inside of a bent pipe."*

The Figure shows the inside channel 10 as a bent pipe (See, e.g., Applicant's specification, page 5, third full paragraph).

(6) GROUNDS OF REJECTION TO BE REVIEWED ON APPEAL

1. Whether claims 16-24 are obvious under 35 U.S.C. § 103(a) over Mead (U.S. 2,770,924) in view of Russell (U.S. 4,773,113).

(7) ARGUMENT: DISCUSSION OF REJECTIONS UNDER 35 U.S.C. § 103(a)

Applicant refers to MPEP §706.02(j) - Contents of a 35 U.S.C. 103 Rejection, which specifies:

> "To establish a *prima facie* case of obviousness, three basic criteria must be met. First, there must be some suggestion or motivation, either in the references themselves or in the knowledge generally available to one of ordinary skill in the art, to modify the reference or to combine reference teachings. Second, there must be a reasonable expectation of success. Finally, the prior art reference (or references when combined) must teach or suggest all the claim limitations. The teaching or suggestion to make the claimed combination and the reasonable expectation of success must both be found in the prior art, and not based on applicant's disclosure. In re Vaeck, 947 F.2d 488, 20 USPQ2d 1438 (Fed. Cir. 1991)."

MPEP §706.02(j).

Applicant respectfully submits that the three criteria for establishing a *prima facie* case of obviousness have not been met.

(7)(1) CLAIMS 16-24 ARE NOT OBVIOUS UNDER 35 U.S.C. § 103(a) OVER MEAD IN VIEW OF RUSSELL

(7) (1.1) Overview of The Present Application

The present application is directed towards a shot-peening device for shot-peening the inner wall of a channel having at least one bend therein. A flexible plastic tube is provided which is advanceable through the bent portion of the channel for introducing a stream of shot-peening particles into the bent portion of the channel. A particle deflection and outlet device is attached to an outlet end for directing the shot-peening particles against the inner wall of the channel. An elongated helically wound wire encloses the

tube for reducing friction between the tube and the inner wall when the tube is advanced through the channel.

Shot-peening is a known method for improving the strength of metallic surfaces by compacting (consolidating) the metal at its surface and in a zone immediately below its surface by impacting the surface with a stream of particles (for example rounded steel shot) in order to improve the metal's resistance to stress or fatigue breakdown.

It is known to use a stiff metal lance with an interior blast nozzle with a sloping surface to introduce shot-peening particles into elongated straight cavities such that the particles are deflected to exit from the blast nozzle transversely to the longitudinal axis of the lance. However, such a stiff metal lance cannot be used to shot-peen the inner wall of a curved channel.

The present application teaches the use of a flexible plastic tube that can be advanced through the bent portion of a channel to enable the shot-peening of bent pipes and the like. A particle deflection device is provided at the outlet end of the tube for deflecting the particles towards the inner wall of the channel. A helically wound wire is employed which encloses the tube for reducing friction between the tube and the inner wall of the channel as the tube is advanced through the channel (in particular the bends in the channel). Accordingly, the tube disclosed by Applicant can be inserted into a bent channel and drawn through the bends of the channel as the shot-peening particles are deflected into the inner walls of the channel. The wire surrounding the tube reduces friction between the inner walls and the tube, enabling the tube to be pulled through bends in the channel without difficulty. The tube can be rotated in the channel as it is drawn through so that the complete interior of the channel is subject to shot-peening.

(7) (1.2) Discussion of Final Office Action and Rejection of Claim 16

The Examiner has rejected claim 16 as being unpatentable over Mead in view of Russell.

Mead discloses a blasting device that uses abrasive material for removing paint, rust, scale or any other deposit from a surface being cleaned without scattering the

removed scale and spent abrasive over the adjacent area (Col. 1, lines 20-25). The blasting device of Mead comprises a gun A which is supplied through a supply line B with abrasive from a storage container C. When blasting, abrasive is pulled into the nozzle in gun A and is impelled at the surface being treated by air jet assembly D. The lower end of gun A is connected to a suction pick-up line E which has a reduced pressure maintained therein, which enables the pick-up and carrying away of the spent abrasive and scale loosened from the work surface (Col. 1, lines 60-69).

The Examiner has relied on Mead as disclosing all elements of Applicant's claim 16, with the exception of Applicant's claimed "elongated helically wound wire enclosing said tube for reducing friction between the tube and said inner wall when the tube is advanced through the channel." The Examiner acknowledges that Mead does not disclose such an elongated helically wound wire surrounding a tube, and relies on Russell as disclosing this subject matter.

Russell discloses a cleaning apparatus comprising a payout drum supporting a snake hose wound thereon and supported for rotation on a portable frame. The hose is in fluid communication with a plurality of fluid tanks to provide a supply of high pressure fluid for external cleaning operations (Abstract). In one embodiment , the hose 110 is provided with an overwound flexible spring 114, to enable the hose to pass through deep P-traps for cleaning of such P-traps (Col. 8, line 65 through Col. 9, line 2).

In the Advisory Action mailed on June 12, 2006, the Examiner indicated:

> *In addition to the information submitted in the Final Rejection, the device of Mead is inherently capable of shot-peening, the jet nozzle 60 does cause particle deflection to particles running on the outer circumference of the tube and deflects them towards the wall and the abrasive supply line while in use would be dragged along the floor of the tube while in use, the floor of the tube inherently being a wall, and would therefore be improved with a friction reducing helical wire about the supply line B.*

Advisory Action, last page, continuation of section 11.

Applicant respectfully submits that neither Mead nor Russell disclose any type of shot-peening device, and thus the combination of these two references could not have led one skilled in the art to Applicant's claimed shot-peening apparatus. To the contrary, both Mead and Russell disclose devices for cleaning a surface.

1st Element of *prima facie* case of obviousness for claim 16

Is there some suggestion or motivation, either in Mead or Russell, or in the knowledge generally available to one of ordinary skill in the art, to modify Mead as suggested by the Examiner to use an overwound flexible spring around the supply line B of Mead for reducing friction when the supply line is advanced through a channel?

As the Examiner has acknowledged, Mead does not disclose the use of any type of helically wound wire around the supply line B for reducing friction between the supply line B and the inner wall of a channel as the supply line B is advanced through a channel. In fact, the device of Mead is not intended for cleaning the inside of a channel or pipe. Mead is only concerned with cleaning surfaces such as those found in engine rooms or other like confined areas (Col. 1, lines 27-30). In Mead, the abrasive particles are dispensed from the blasting gun A which must be positioned perpendicular to the work surface 10. With such a structure, the supply line B would never ride along the wall surface as the apparatus is advanced. Accordingly, motivation for using such a helically wound wire enclosing the supply line cannot be found in Mead.

Russell discloses the use of an overwound flexible spring 114 around hose 110 in order to enable the hose 110 to pass through very deep P-traps during cleaning of drain pipes (Col. 8, line 65 through Col. 9, line 2). A "P-trap" is piece of pipe shaped like the letter P, used in drains. Its shape prevents fumes or sewage gases from going against the flow of draining water and entering the interior of a home. The hose 110 of Russell is fed into the drain line and uses a high-pressure liquid, sometimes together with a cutter blade, to clean the drain lines or to clear a blocked area of the drain.

There is no suggestion or motivation found in Russell to modify a cleaning device as disclosed in Mead by providing a flexible spring around the supply line B of Mead. It would be readily apparent to one skilled in the art that the device of Mead is not intended

for use in the inside of channels, since the blasting gun A must be positioned perpendicular to the work surface 10. Further, in Mead, the blasting gun A is connected not only to supply line B, but also to suction pick-up line E and air supply conduit 22 with a control valve G positioned on the end thereof (Figure 1). Accordingly, it would be very difficult to advance the cumbersome device of Mead through a curved channel or drain pipe. There is certainly no suggestion of enclosing the supply line B, the pick-up line E, and the air supply line 22 of Mead with a helically wound wire to reduce friction to enable all these lines be passed through a curved channel. Nor is there any reason to reduce friction on these lines of Mead, as Mead relates to a floor standing device intended to be used on walls and/or floors of rooms which do not frictionally engage the lines B, E, and 22 in a manner anything like Applicant's tube 20 is frictionally engaged by pipe 10.

In addition, Mead discloses a cleaning device for cleaning surfaces using an abrasive material. One skilled in the art would appreciate that such a device would not be used for cleaning the interior of pipes (as is the device of Russell) since the abrasive material would most likely lead to further clogging of the pipes, especially in the areas of any curves. Cleaning devices for the interior of pipes typically use a high-pressure liquid, a cutting device, or both, as is taught by Russell. Accordingly, there would be no motivation to combine the disparate teachings of Russell and Mead.

Further, despite the Examiner's assertions, one skilled in the art would not look to either Mead or Russell when designing or modifying a shot-peening apparatus, since neither Mead nor Russell discloses any type of shot-peening apparatus. Applicant respectfully disagrees with the Examiner's unsupported conclusion in the Advisory Action that the device of Mead is inherently capable of shot-peening. Shot-peening requires particles of particular sizes, material, and hardness which are propelled at particular intensities, all of which may depend on the type of surface being treated and type of surface treatment desired, which are much different than those used for blast cleaning of surfaces. Accordingly, a particularly specialized device is required for shot-peening to accommodate the particular particles used and to provide appropriate control of the intensities and pressures required. Assuming *arguendo* that the device of Mead

could somehow be modified for shot-peening, there is no suggestion that it could be used for shot-peening the inside wall of a bent or curved channel. As discussed above, the multiple lines B, E, and 22 attached to gun A would serve to inhibit the insertion of Mead's device into a channel having bends therein. Further, the abrasive supply line B in Mead would not normally contact (and is certainly not intended to contact) the work surface being cleaned.

Even in the imaginative example given by the Examiner, where "if the pipe is big enough for me to stand in I could hold this tool and peen the walls" (Final Office Action, page 5, paragraph 10), the abrasive supply line B would not contact the walls of the pipe as the operator would be holding it off the bottom wall of the pipe that he would be standing on. In Mead, the abrasive particles are dispensed from the blasting gun A perpendicular to the work surface 10. With such a structure, the supply line B would not ride along the work surface as the apparatus is advanced. In Mead, only the maze 63 at the head of the gun A contacts the work surface (Col. 5, lines 44-45). Thus, an elongated helically wound wire enclosing the supply line B would not reduce friction between the supply line and the pipe wall, because there is no such friction to begin with. Clearly, there would be no motivation to combine Mead and Russell, as there is no need to reduce friction in Mead where lines B, E, and/or 22 are not intended to be inserted into or carried within the confines of the inner wall of a bent channel.

Only with hindsight impermissibly gained from Applicant's disclosure could one of ordinary skill in the art arrive at the conclusions reached by the Examiner. See also, MPEP § 2142.

Thus, the First Element of a *prima facie* case of obviousness is not met for claim 16.

2nd Element of *prima facie* case of obviousness for claim 1

Is there a reasonable expectation of success in modifying the blast cleaning device of Mead as suggested by the Examiner to use an overwound flexible spring around the supply line B for reducing friction when the supply line is advanced through a channel?

As discussed above, there is no suggestion or motivation for one skilled in the art to combine the disclosures of Mead and Russell as indicated by the Examiner. Assuming *arguendo* that motivation for such a combination can somehow be found, it would apparently be a simple matter to add an overwound flexible wire around the supply line B of Mead. However, the addition of such a spring would not lead to a reduction in friction between the supply line B and the inner wall of a curved channel since, as discussed above, the device of Mead is not intended or designed for insertion into or advancement through a channel. Further, simply adding a spring around the supply line B of Mead would still leave pick-up line E (which attaches to gun A at an angle) and air supply conduit 22 without any spring and these lines, together with control valve G and casing 75 at the end gun end of the device would cause friction and impede the device in the event there was an attempt to advance it through any channel, especially a channel with a bent portion.

Further, Applicant respectfully submits that the combination of Mead and Russell as suggested by the Examiner would not successfully result in Applicant's claimed invention as set forth in claim 16. In particular, such a modification to the supply line B of Mead would not serve successfully to change the cleaning device of Mead into a shot-peening apparatus as claimed by Applicant.

Thus, the Second Element of a *prima facie* case of obviousness is not met for claim 16.

3rd Element of *prima facie* case of obviousness for claim 16

Does the combination of Mead and Russel teach or suggest all the limitations of claim 16?

Mead simply does not disclose or remotely suggest any type of shot-peening apparatus. Rather, Mead discloses a device for blast cleaning a surface using an abrasive material which is impelled at the surface to be cleaned. The intent of the device disclosed in Mead is to remove paint, rust, scale or the like from the surface that is impinged. The main object of the Mead invention is to avoid scattering the spent abrasive and the removed material over the adjacent area. The blast cleaning apparatus of Mead is

intended for and is only suitable for removing material. Applicant's shot-peening apparatus is used to improve the strength of metallic surfaces by compacting (consolidating) the metal at its surface and in a zone immediately below the surface. Mead does not (and has no intention of) providing such a metal compacting function.

While Applicant acknowledges that with the shot-peening process, cleaning of the surface being shot-peened may occur as an incidental byproduct of the shot impinging on the surface being treated, this is not the purpose of the process. However, the converse is not true: a blast cleaning device cannot be used for shot-peening of a surface. Although the abrasive particles may effect some alteration to the surface as an incidental byproduct, depending on the velocity and mass of the particles, a blast cleaning device does not provide sufficient control over the velocity of the particles expelled therefrom to provide a reproducible result as is necessary with a shot-peening device. In addition, the type of material used for blast cleaning is not of the quality or uniformity required for shot-peening. Further, a blast cleaning device is designed to clean a surface without damaging or altering that surface. A shot-peening device is designed to alter at least a surface layer of the material being treated by compacting or consolidating the metal at its surface. This result occurs due to impacting the surface with a stream of particles (typically metal shot) in order to improve the metal's resistance to stress or fatigue breakdown. To the contrary, the blast cleaning apparatus of Mead is intended for and is only suitable for removing material. Thus, the Examiner's unsupported assertion set forth in the Advisory Action that the device of Mead is inherently capable of shot-peening is misplaced.

The objective of Mead is achieved by connecting a suction line E to a surface-treating head or gun A so that the spent abrasive and the removed material is sucked from the treated surface immediately after the abrasive particles hit the surface to be treated. In connection with this intended operation, an air-pervious maze 63, baffle 80 and body 81 provide a "hood" that encloses a portion of the surface around the area being cleaned. (Col. 5 lines 43-45 and Col. 5, line 74 to Col. 6 line 2). From Figures 2 and 3 of Mead it can be seen that the only part of the apparatus that comes into contact with the surface being cleaned (other than the abrasive), is the maze 63. The abrasive supply line B does not come anywhere near the surface being cleaned. Thus, there is no friction created

between the supply line B and the inner wall of a channel as is the case during use of Applicant's claimed invention.

Applicant's claim 16 also recites a flexible plastic tube advanceable through the bent portion of a channel for introducing a stream of shot-peening particles into the bent portion. The Examiner points to the abrasive supply line B of Mead as being equivalent. However, supply line B does not introduce shot-peening particles into a channel; it only carries a cleaning abrasive. Further, as discussed in detail above, the device of Mead is not adapted for insertion into a channel having at least one bend in a longitudinal direction thereof, as is the case with Applicant's claimed invention.

Claim 16 further recites a particle deflection and outlet device for directing the shot-peening particles against the inner wall of the channel. In the Final Office Action and in the Advisory Action the Examiner asserts that nozzle bore 60 of Mead forms a deflection device equivalent to that of Applicant's claimed invention. In particular, in the Advisory Action the Examiner states:

> . . . *the jet nozzle 60 does cause particle deflection to particles running on the outer circumference of the tube and deflects them towards the wall*

Advisory Action, last page, continuation of section 11.

Applicant respectfully disagrees with the Examiner's characterization of Mead. The jet nozzle 60 of Mead is a straight through nozzle. The jet nozzle 60 is only used to manipulate the annular gap 62 between the jet and the mixing tube to adjust the amount of abrasive that flows in a given time interval. (Col. 6, lines 5-21). Contrary to the Examiner's assertions, the nozzle 60 does not "deflect" (i.e., change the direction or course of) shot-peening particles so that they impinge the inner wall of a channel when the supply line is advanced therethrough. As can be seen in Figures 2 and 3 of Mead, the abrasive cleaning particles are at all times shot straight through the apparatus from the jet assembly and blasting gun to the work surface. Compare this to Applicant's Figure 1, where it is seen that the shot-peening particles from the tube 20 travel longitudinally through the tube to nozzle 22, where they are deflected (90° in the example shown) by the deflection member 26. Mead does not disclose or remotely suggest a particle

deflection and outlet device as claimed by Applicant, where the device is used to direct shot-peeing particles against the inner wall of a channel.

The only deflection of particles in Mead occurs when the abrasive particles first hit the surface to be treated. After hitting this surface, the abrasive particles are deflected in order to be sucked into the suction pick-up line E. This deflection has nothing to do with the deflection provided by the particle deflection device of Applicant's claim 16, which directs the shot-peening particles against the inner wall of a channel. In particular, in Applicant's structure the shot-peening particles hit the wall only ***after*** deflection by the deflection device. In contrast thereto, in Mead the abrasive particles first hit the surface to be treated, and are then deflected in order to be sucked into the suction pick-up line E. Deflection of the abrasive particles upstream of the surface to be treated in Mead would make no sense, because in Mead, the blasting gun has a longitudinal direction that is perpendicular to the work surface.

The Examiner has acknowledged that Mead does not disclose Applicant's claimed "elongated helically wound wire enclosing said tube for reducing friction between the tube and said inner wall when the tube is advanced through the channel." The Examiner relies on Russell as disclosing this subject matter. Russell does not cure the deficiencies of Mead noted above.

Russell, like Mead, does not disclose or remotely suggest any type of shot-peening apparatus. Rather, Russell discloses a device for cleaning the inside of drain pipes using a high-pressure liquid. The cleaning device of Russell does not expel any type of particle or shot, but rather expels high-pressure liquid. Such a device as disclosed in Russell is even further removed from a shot-peening apparatus than is the device of Mead.

Russell discloses a flexible snake 26 which is advanceable through a bent portion of a drain which introduces liquid into the drain for purposes of cleaning the drain or removing clogs therefrom. This flexible snake 26 is not adapted for introducing shot-peeing particles into a channel for shot-peening the inner walls of the channel as is the case with Applicant's claimed flexible hose.

The nozzle 108 of Russell may have side apertures to effect radial jetting of the high pressure liquid against the inner walls of a drain pipe. However, such a nozzle with apertures are not equivalent to Applicant's claimed deflection and outlet device as such a nozzle 108 is not adapted to direct shot-peening particles against the inner wall of the pipe. It is apparent to one skilled in the art that such a nozzle 108 would not be suitable for directing shot-peening particles, as such apertures, which are apparently sized for expelling liquid therefrom, would quickly become clogged by shot-peening particles.

Russell does disclose the use of an overwound flexible spring 114 around hose 110 in order to enable the hose 110 to pass through very deep P-traps during cleaning of drain pipes (Col. 8, line 65 through Col. 9, line 2). As discussed in detail above, the abrasive supply line B in Mead, even if surrounded by such a flexible spring, would not normally contact (and is certainly not intended to contact) the work surface being cleaned. Moreover, there is no motivation in either of the references cited by the Examiner to take the spring of Russell and incorporate it with the supply line of Mead. As noted above, Mead does not require any means for reducing friction as claimed by Applicant.

Accordingly, Mead and Russell, even when taken in combination, do not disclose or remotely suggest the features of Applicant's claim 16.

Thus, the Third Element of a *prima facie* case of obviousness is not met for claim 16.

(7)(1.3) Discussion of Final Office Action and Rejection of Dependent Claims 17-24

The arguments set forth above with respect to independent claim 16 apply equally to Applicant's dependent claims 17-24, which each ultimately depend from claim 16.

(7)(1.3.1) Discussion of Rejection of Claim 17

Claim 17 is rejected as being unpatentable over Mead in view of Russell. Claim 17 depends from claim 16 and specifies that the tube is a polyurethane tube. The

Examiner acknowledges that neither Mead nor Russell disclose the use of a polyurethane tube. However, the Examiner indicates that the use of a polyurethane tube would have been an obvious design choice to one skilled in the art (Final Office Action, page 3, paragraph 4).

Applicant respectfully disagrees with the Examiner's assertions. As discussed in detail above, Mead discloses a blast cleaning device and Russell discloses a cleaning device for drains which uses a high-pressure liquid. Neither Mead nor Russell disclose or relate in any way to a shot-peening apparatus as claimed by Applicant. Accordingly, what may be an obvious design choice for material for a hose to be used with a cleaning device of the type disclosed in Mead or Russell has no bearing on Applicant's claimed invention, which utilizes a polyurethane hose in the claimed shot-peening apparatus for introducing shot-peening particles into the channel (rather than a hose used for liquid as in Russell or for abrasive particles as in Mead).

Accordingly, the combination of Mead and Russell does not disclose or remotely suggest the features of Applicant's claim 17.

(7)(1.3.2) Discussion of Rejection of Claims 18 and 19

Claims 18 and 19 are rejected as being unpatentable over Mead in view of Russell. Claims 18 and 19 depend from claim 16. Claim 18 specifies that the diameter of the wire is equal to the thickness of the wall of the tube. Claim 19 specifies the diameter of the wire is smaller than the thickness of the wall of the tube.

In rejecting claims 18 and 19, the Examiner relies on Russell for teaching "that the diameter of the wire used is dependent on the flexibility and stiffness of the tube desired in that he discloses two different tubes and wire enclosures with different properties (figures 5 and 6)" (Final Office Action, page 3, paragraph 5).

In discussing Figure 5, Russell indicates only that:

> *. . . cable member 26A is an open end wind wire which is sized to afford good flexibility to the snake hose 26. That is, the cable member 26A is determined to have sufficient stiffness to impart rotation from the drum*

> *assembly 22 to a cutter blade and nozzle assembly, while at the same time, it is sufficiently flexible as to easily bend back over itself, such as, for example, by tying a length thereof into a knot by manual pressure alone and to again be extended without permanent distortion.*

Russell, Col. 8, lines 8-20.

In discussing Figure 6, Russell indicates that:

> *While the stiffness of the spring 114 is not critical, the spring 114 should permit that portion of the free end of the hose 110 which is covered thereby to fold back easily over itself, thus permitting ease of sharp turning within a P-trap or a short bend.*

Russell, Col. 9, lines 2-7.

With Applicant's claimed invention, the diameter of the wire is equal to or smaller than the thickness of the wall of the tube so as not to appreciably impair the flexibility of the tube (see, e.g., Applicant's specification, page 4, second full paragraph).

There is simply no discussion or suggestion in Russell of any relationship between the diameter of the spring wire and the thickness of the hose wall.

Accordingly, the combination of Mead and Russell does not disclose or remotely suggest the features of Applicant's claims 18 and 19.

(7)(1.3.3) Discussion of Rejection of Claim 20

Claim 20 is rejected as being unpatentable over Mead in view of Russell. Claim 20 depends from claim 16 and specifies that the distance between sections of the helically wound wire adjacent to one another in a longitudinal direction of the tube is approximately the same or smaller than the diameter of the wire when the tube extends in a straight line.

The Examiner relies on Figures 5 and 6 of Russell in his rejection of claim 20 (Final Office Action, page 4, paragraph 6). Applicant acknowledges that Figures 5 and 6 show gaps between sections of the wire that make up the springs when the hose is extended in a longitudinal direction. However, Russell does not mention any details about

the diameter of the wire in the spring 26A of Figure 5 or the spring 114 in Figure 6. Further, Russell does not mention any details about the size of the gaps between the wires shown in Figures 5 and 6.

With Applicant's invention according to claim 20, the distance between sections of the helically wound wire adjacent to one another in a longitudinal direction of the tube is approximately the same or smaller than the diameter of the wire when the tube extends in a straight line. Therefore, even when the tube is passing through sharp bends it is assured that the tube itself does not come into contact with the inner wall of the channel (see, e.g., Applicant's specification, page 4, third full paragraph). In contrast, the spaces between sections of wire shown in Figures 5 and 6 of Russell appear to be larger than the diameter of the wire itself (especially in Figure 6). Further, in Russell it is specifically stated that the hose 26, 110 with the respective spring 26A, 114 thereon is sufficiently flexible so that it is capable of bending back over on itself (Col. 8, lines 16-17 and Col. 9, lines 4-6). Therefore, it is apparent that, when the hose of Russell is bent to a great extent, the spring will not prevent the hose from contacting a wall of the drain.

Accordingly, the combination of Mead and Russell does not disclose or remotely suggest the features of Applicant's claim 20.

(7)(1.3.4) Discussion of Rejection of Claim 21

Claim 21 is rejected as being unpatentable over Mead in view of Russell. Claim 21 depends from claim 20 and specifies that sections of the helically wound wire adjacent to one another in a longitudinal direction of the tube abut on one another when the tube extends in a straight line.

The Examiner apparently acknowledges that Russell does not disclose that the wire 26A, 114, surrounding hose 26, 110 does not have sections which abut one another as claimed by Applicant. The Examiner rejects claim 21 based on his assertion that having the sections of wire about one another is an obvious design choice in view of Figures 5 and 6 of Russell.

With Applicant's invention according to claim 20, the sections of the helically wound wire adjacent to one another in a longitudinal direction of the tube abut on one another when the tube extends in a straight line. Therefore, even when the tube is passing through sharp bends it is assured that the tube itself does not come into contact with the inner wall of the channel (see, e.g., Applicant's specification, page 4, third full paragraph).

Figures 5 and 6 of Russell show gaps between sections of the springs 26A, 114. Applicant respectfully submits that such gaps enable the hose to be sufficiently flexible so that it is capable of bending back over on itself (Col. 8, lines 16-17 and Col. 9, lines 4-6). One skilled in the art would appreciate that modifying Russell by having the sections of wire in springs 26A, 114 abut one another would destroy this great degree of flexibility required by the cleaning device of Russell, which enables it to be fed through sharp bends such as those in a P-trap. Therefore, having the spring sections abut one another as claimed by Applicant would not be an obvious design choice in view of the disclosure of Russell.

Accordingly, the combination of Mead and Russell does not disclose or remotely suggest the features of Applicant's claim 21.

(7)(1.3.5) Discussion of Rejection of Claim 22

Claim 22 is rejected as being unpatentable over Mead in view of Russell. Claim 22 depends from claim 16 and specifies that the wire is a spring wire.

Applicant acknowledge that the wire 114 of Russell comprises a spring wire. However, as discussed in detail above, Russell is directed towards a particular type of drain cleaning apparatus where the hose is adapted to deliver a high-pressure liquid for cleaning the inside of drain pipes. Russell, like Mead, does not disclose or suggest any type of shot-peening apparatus.

Accordingly, the combination of Mead and Russell does not disclose or remotely suggest the features of Applicant's claim 22.

(7)(1.3.6) Discussion of Rejection of Claim 23

Claim 23 is rejected as being unpatentable over Mead in view of Russell. Claim 23 depends from claim 16 and specifies that the helically wound wire has ends which are held at the tube to restrain displacement of the wire relative to the tube in a longitudinal direction of the tube.

In rejecting claim 23, the Examiner states that "Russell teaches that the spring wire coil is held between the two ends of the tube so as to maintain proper stiffness of the tube as can be seen in Figure 5" (Final Office Action, page 5, paragraph 9). Applicant acknowledges that Figure 5 shows that the ends of the spring wire are held between hollow tub 30 and cable end terminal member 104 which serves to restrain displacement of the wire relative to the hose in a longitudinal direction. However, as discussed in detail above, Russell is directed towards a particular type of drain cleaning apparatus where the hose is adapted to deliver a high-pressure liquid for cleaning the inside of drain pipes. Russell, like Mead, does not disclose or suggest any type of shot-peening apparatus.

Accordingly, the combination of Mead and Russell does not disclose or remotely suggest the features of Applicant's claim 23.

(7)(1.3.7) Discussion of Rejection of Claim 24

Claim 24 is rejected as being unpatentable over Mead in view of Russell. Claim 24 depends from claim 16 and specifies that the channel is the inside of a bent pipe.

In rejecting claim 24, the Examiner indicates that:

Regarding claim 24 as best understood for purposes of examination, Mead/Russell is capable of shot-peening the inside of a bent pipe just as well as the channel depending on the diameter of the pipe which is not specified, i.e., if the pipe is big enough for me to stand in I could hold this tool and peen the walls.

Final Office Action, page 5, paragraph 10.

As discussed in detail above, neither Mead nor Russell disclose or suggest any type of apparatus for shot-peening the inside wall of a channel. Similarly, neither

reference discloses or remotely suggests any type of apparatus for shot-peening the inside wall of a bent pipe.

Further, as discussed above, Mead is not suitable for use inside a pipe, since it projects abrasive particles in a straight line from jet assembly D towards the surface being cleaned. Accordingly, the device of Mead must be held substantially perpendicular to the surface being cleaned. In addition, as discussed above, the jet assembly D with gun A and multiple hose attachments would hinder the introduction of the jet assembly D into a bent channel or pipe.

It is clear from Applicant's specification and claim language that the claimed shot-peening apparatus is for use in cleaning the inside wall of a bent pipe that is not large enough for the operator to stand in as argued by the Examiner. In particular, there would be no need to provide a particle deflection and output device for directing the shot-peening particles against the inner wall if the pipe were large enough to stand in, since in that case the device, including hose and output assembly, could be positioned perpendicular to the wall so that no deflection of the shot-peening particles would be required. In addition, if the bent pipe were large enough to walk through, there would be no need to reduce the friction between the hose and the pipe wall, since the hose would in such an instance be significantly smaller than the pipe diameter and there would be no concern for the hose becoming stuck in such a large pipe.

In addition, Applicant's specification contemplates use of the inventive shot-peening device in pipes or channels that are not large enough for a human operator to stand in, such as stabilizers for motor vehicles and camshafts (see, e.g., Applicant's specification, page 2, second full paragraph).

Accordingly, the combination of Mead and Russell does not disclose or remotely suggest the features of Applicant's claim 24.

(8) CONCLUSION

Applicant respectfully submits that the present invention set forth in claims 16-24 would not have been obvious to one skilled in the art in view of Mead in combination with Russell, or any of the other prior art of record.

In particular, there is no motivation for one skilled in the art to combine the references in the manner suggested by the Examiner. Only with hindsight impermissibly gained from Applicant's disclosure could one of ordinary skill in the art arrive at the conclusions reached by the Examiner.

Neither Mead nor Russell disclose or remotely suggest any type of shot-peening apparatus. Mead is directed towards a blast cleaning device which uses abrasive particles to clean surfaces. Russell is directed towards an apparatus for cleaning the inside of drain pipes using a high-pressure liquid. Thus the teachings of Russell and Mead are not only far removed from that of Applicant's claimed invention, they are far removed from one another.

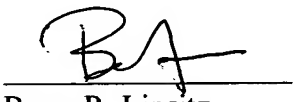
In addition, there would have been no motivation to modify Mead to use the wire spring of Russell. In particular, since the device of Mead is not adapted for use inside of a pipe or channel, there is no need to add a friction reducing spring around the hose of Mead.

Further, even if the teachings of Mead and Russell were combined as suggested by the Examiner, such a combination would not result in Applicant's claimed invention. Rather, simply modifying the supply line B of Mead as indicated by the Examiner to include the wire spring of Russell would not serve successfully to change the blast cleaning device of Mead into a shot-peening apparatus as claimed by Applicant.

Finally, as discussed in detail above, the combination of Mead and Russell does not teach all the limitations of claim 16 or any of the dependent claims 17-24. Simply put, neither reference teaches or remotely suggest a shot-peening apparatus as claimed by Applicant.

In view of the above, reversal of the rejections set forth in the Final Office Action is respectfully requested.

Respectfully submitted,



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(9) CLAIMS APPENDIX

The claims involved in the appeal, namely claims 16-24, are as follows:

16. A shot-peening apparatus for shot-peening, with a stream of shot-peening particles, an inner wall of a channel having at least one bend in a longitudinal direction thereof, said apparatus comprising:

a flexible plastic tube advanceable through the bent portion of the channel for introducing said stream of shot-peening particles into the bent portion of the channel,

an outlet end on said tube,

a particle deflection and outlet device attached to said outlet end for directing the shot-peening particles against the inner wall of said channel, and

an elongated helically wound wire enclosing said tube for reducing friction between the tube and said inner wall when the tube is advanced through the channel.

17. The shot-peening apparatus of claim 16, wherein the tube is a polyurethane tube.

18. The shot-peening apparatus of claim 16, wherein the diameter of the wire is equal to the thickness of the wall of the tube.

19. The shot-peening apparatus of claim 16, wherein the diameter of the wire is smaller than the thickness of the wall of the tube.

20. The shot-peening apparatus of claim 16, wherein the distance between sections of the helically wound wire adjacent to one another in a longitudinal direction of the tube is approximately the same or smaller than the diameter of the wire when the tube extends in a straight line.

21. The shot-peening apparatus of claim 20, wherein sections of the helically wound wire adjacent to one another in a longitudinal direction of the tube abut on one another when the tube extends in a straight line.

22. The shot-peening apparatus of claim 16, wherein said wire is a spring wire.

23. The shot-peening apparatus of claim 16, wherein the helically wound wire has ends which are held at the tube to restrain displacement of the wire relative to the tube in a longitudinal direction of the tube.

24. The shot-peening apparatus of claim 16, wherein said channel is the inside of a bent pipe.

(10) EVIDENCE APPENDIX

[NONE]

(11) RELATED PROCEEDINGS APPENDIX

[NONE]

PATENT

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In re Application of:

E. Baiker

Application No.: 10/656,831

Filed: September 5, 2003

Examiner: C. Koehler

Art Unit: 3726

For: **DEVICE AND METHOD FOR THE BLASTING TREATMENT OF CHANNEL INNER WALLS**

EXPRESS MAIL CERTIFICATE

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Carol Prentice
(Typed or printed name of person mailing paper or fee)

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Respectfully submitted,

Date: **August 2, 2006**
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Sir:

Transmitted herewith is:

[X] A check in the amount of $500.00 (fee set forth in 37 C.F.R.§41.20(b)(2) for filing a brief);

[X] Express Certificate for EV 897799265 US

[X] Appellant's Brief (30 pages);

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[X] I certify that this correspondence is being deposited with the United States Postal Service with sufficient postage as "Express Mail" in an envelope addressed to: **Mail Stop Appeal Brief - Patents, Commissioner for Patents, P.O. Box 1450, Alexandria, VA 22313-1450** on **August 2, 2006.**

The Commissioner is hereby authorized to charge any deficiency in the payment of the required fee(s) or credit any overpayment to Deposit Account No. 50-0625.

Very truly yours,

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